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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,831	01/12/2007	Yasuhiko Nabeshima	288980US0PCT	5494

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EXAMINER

REDDY, KARUNA P

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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11/24/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/573,831	Applicant(s) NABESHIMA ET AL.	
	Examiner KARUNA P. REDDY	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to amendment filed 9/8/2009. Claims 1 and 3 are amended; claims 12-14 are added. Accordingly, claims 1-14 are currently pending in the application.

This action is made final in light of limitations to the claims that are newly presented following the preceding office action.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The amendment filed 9/8/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: amendment to paragraph 0035 on page 23 - "Examples 1 to 7, 6, Referential Example 1, Comparative Examples 1 to 3", and Table 2 on page 24 (~~Example 7~~ Ref. Ex. 1). It is noted that, while scope of the claims can be changed during prosecution, amendment should not introduce new matter into the disclosure of invention. Hence, referring to inventive example 7 of instant application as a referential example (i.e. falling outside the scope of claimed subject matter) introduces new matter into the disclosure.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

4. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al (JP 59-78219 A).

It is noted that an English translation of Kawakami et al is being used in the rejection set forth below.

Kawakami et al disclose, in example 8, a copolymer comprising 15 % by weight of t-butyl styrene, 40% by weight of styrene (a total of 55% by weight of aromatic vinyl monomer) and 45% by weight of phenyl methacrylate. The molecular weight of copolymer is 140,000. Copolymer has improved fluidity and thermal stability in the molten state and can be molded by injection molding (abstract). The polymerization is conducted in aqueous medium in the presence of sodium dodecyl benzene sulfonate (i.e. reads on emulsion polymerization of instant claims). Given that compositional limitations are met, it is the examiner's position that copolymer of Kawakami et al is inherently capable of functioning as a flowability improver for engineering plastics.

Therefore, Kawakami et al anticipate the instant claims.

Claim Rejections - 35 USC § 103

5. Claims 1-9 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al (US 4,906,696) in view of Kawakami et al (JP 59-78219 A).

It is noted that an English translation of Kawakami et al is being used in the rejection set forth below.

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Fischer et al disclose transparent thermoplastically processible blends of (A) polycarbonates and (B) methacrylate copolymers (abstract). See example 10 wherein the copolymer is formed from a mixture of 60 parts by weight of methyl methacrylate (MMA), 20 parts by weight of α -methylstyrene (α -MS i.e. an aromatic vinyl monomer), 20 parts by weight of Phenyl methacrylate (PhMA) and has a molecular weight of 89,000 (column 10, lines 15-31). See example 61, where 90 parts by weight of Makrolon (i.e. polycarbonate resin) and 10 parts by weight of the methacrylate copolymer from example 11 are used to prepare the thermoplastically processible blend. The thermoplastic processing of polycarbonate which has a high melt viscosity as a characteristic of the material, can be facilitated by alloying thermoplastic polymethacrylate plastic without changing substantially the other properties of the polycarbonate (column 7, lines 34-40). Blends of polymeric components (A) and (B) can be processed by injection molding into the widest variety of molded objects (column 7, lines 58-61). The polymers are prepared by known procedures, for the polymerization of α , β -unsaturated monomers, such as suspension polymerization (column 6, lines 36-41). The compatibility of polymers in blends depends on the degree of polymerization. As a rule compatibility decreases with increased molecular weight and the preferred molecular weight is from 5,000 to 150,000 (column 6, lines 48-66).

Fischer et al differ with respect to the wt% of aromatic vinyl monomer and wt% (meth)acrylate monomer having an ester group of phenyl group.

However, Kawakami et al teach a copolymer comprising 5 to 55 wt% of t-butyl styrene, 1-85% by weight of styrene and greater than 10% by weight of (meth)acrylate such as methyl methacrylate and phenyl methacrylate. The copolymer has improved fluidity and thermal stability in the molten state and can be moulded by injection molding

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(abstract). See example 4 wherein copolymer comprises 15 % by weight of t-butyl styrene, 40% by weight of styrene (a total of 55% by weight of aromatic vinyl monomer) 45% by weight of phenyl methacrylate. See example 7 wherein copolymer is formed from 50 wt% of t-butyl styrene, 40 wt% of styrene (i.e. a total of 90% by weight of aromatic vinyl monomer) and 10 parts of methyl acrylate, which is functionally equivalent to phenyl methacrylate. Therefore, in light of the teachings in Kawakami, it would have been obvious to one skilled in art at the time invention was made to blend the engineering plastics (such as polycarbonate) of Fischer et al with copolymer of Kawakami et al because Fischer et al teach that thermoplastic processing of polycarbonate which has high melt viscosity can be facilitated by alloying thermoplastic polymethacrylate copolymer comprising aromatic vinyl monomer, phenyl methacrylate and MMA and Kawakami et al have shown that copolymers comprising substantially similar monomers with higher content of styrene monomer exhibits improved fluidity and thermal stability in molten state.

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer et al (US 4,906,696) in view of Kawakami et al (JP 59-78219 A) as applied to claim 6 above and further in view of Okazaki et al (JP 11-181197).

The discussion with respect to Fischer et al in view of Kawakami et al in paragraph 5 above is incorporated here by reference.

Fischer et al and Kawakami et al are silent with respect to automobile member and lamp cover.

However, Okazaki et al teach polycarbonate composition to which is added a flowability improver comprising a copolymer of aromatic vinyl monomer and monomers

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having polar groups (abstract). The polycarbonate is widely used as engineering plastic because of excellent transparency and mechanical strength, and can be used to form parts for car and electrical related parts. Therefore, in light of the teachings in Okazaki et al, it would have been obvious to one skilled in the art at the time invention was made to injection mold the composition of Fischer et al in view of Kawakami et al into automobile parts and electrical parts such as lamp covers, because Fischer et al in view of Kawakami et al contemplate injection molding the composition into a wide variety of molded objects and Okazaki teaches that engineering plastics comprising polycarbonate and flowability improver can be molded into electrical and automobile parts, and one skilled in the art would expect the molding of the composition of Fischer et al in view of Kawakami et al into automobile and electrical parts such as lamp covers to work, motivated by expectation of success.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al (JP 01-115914) in view of Fischer et al (US 4,906,696).

Sato et al teach a methacrylic resin comprising 15-75 wt% of phenyl methacrylate, 20-65 wt% aromatic vinyl monomer and 5-30 wt% of other monomer such as acrylonitrile (abstract). See example 2 (Table 1) wherein 30 parts weight of phenyl methacrylate and 50 parts by weight of styrene are polymerized in the presence of chain transfer agent (i.e. mercaptan as molecular weight regulator). The resin formed can be used as a molding material (page 6, lines 13-14).

Sato et al is silent with respect to molecular weight of the copolymer of present claims.

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However, Fischer et al teach that compatibility of polymers in blends depends on the degree of polymerization. As a rule compatibility decreases with increased molecular weight and the preferred molecular weight is from 50,00 to 150,000. The copolymer with controlled molecular weight is prepared by polymerization in the presence of molecular weight regulators such as mercaptans (column 6, lines 48-66). Given that the copolymer of Sato et al is prepared in the presence of chain transfer agents such as mercaptans and workability improves when the aromatic vinyl monomer is used in the range of from 20 to 65 wt% of the copolymer, methacrylic resin in example 2 of Sato et al combined with a molecular weight of between 50,000 to 150,000 can be used as a flow improver in the polycarbonate composition of Fischer et al, because Sato et al contemplates use of chain transfer agents to regulate molecular weight and Fischer et al teach that copolymers with a molecular weight of from 50,000 and 150,000 have improved compatibility with other polymers and can function as flow improvers and one skilled in the art would expect copolymer of Sato et al combined with a molecular weight of from 50,000 to 150,000 to work as a flow improver, motivated by expectation of success.

Response to Arguments

8. The objections, and rejections under 35 U.S.C. § 102 and 103 as set forth in paragraphs 2, 4 and 7 in the preceding office action mailed 4/8/2009 are hereby overcome in light of the amendments filed 9/8/2009.

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9. Applicant's arguments filed 9/8/2009 have been fully considered but they are not persuasive. Specifically, applicant argues that (A) it should be apparent that the average molecular weight of Sato's methacrylic resin is greater than 5,000 to 150,00 required by instant claims and is thus unsuitable for use as a flowability improver; (B) Sato does not teach that methacrylic resin is compatible with resins such as polycarbonates or that reduction in average molecular weight would make them useful as flowability improvers; and (C) inventive examples show the injectable polymers prepared from monomer composition comprising at least 50% by mass of aromatic vinyl monomer and at most 50% by mass of a phenyl or substituted phenyl (meth)acrylates have far superior melt flowability and chemical resistance than comparative examples 1-3 and referential example 1.

With respect to (A), firstly, Sato is silent with respect to the molecular weight. Secondly, examiner did Graham v. Deere analysis and brought in the teachings from Fischer which states that compatibility of polymers in blends depends on the degree of polymerization (i.e. teaches the importance of molecular weight in blending of polymers) and that thermoplastic processing of polycarbonates can be facilitated by alloying with copolymers comprising styrene and phenyl methacrylate.

With respect to (B), Fischer et al teach that methacrylate copolymer of styrene and phenyl methacrylate having low molecular weight are compatible with thermoplastic resins such as polycarbonate and function as flowability improvers.

With respect to (C), applicant's attention is drawn to melt flowability and chemical resistance of comparative example 1 which exhibits better melt flowability and similar chemical resistance as that of the inventive examples and is outside the scope of instant

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claims (i.e. does not contain any PhMA). Therefore, applicant's arguments are not persuasive.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARUNA P. REDDY whose telephone number is (571)272-6566. The examiner can normally be reached on Monday-Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. P. R./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796